III. REMARKS

1. Claims 1-7 and 9-16 remain in the application. Claims 17-39 are new. Support for claims 17-23 may be found in the application, for example, on page 5, line 23 through page 6, line 9.

2. Claim 12 is objected to because of its dependency. The application was originally filed with 11 claims. Claim 12 was added during prosecution to further define the invention of claim 1, and therefore properly depends from claim 1.

3. Applicants respectfully submit that claims 1-7 and 9-16 are not anticipated by Ho (US 5,757,365) under 35 U.S.C. 102(b).

Ho fails to disclose or suggest a display element having two modes, a full-screen mode to use the entire display element to display a first information and a partial screen mode to use a first part of the display element in which partial screen mode a second part of the display element is switched off, as recited by claims 1 and 13. Claims 11 and 15 include similar features.

Ho also fails to disclose or suggest a changing means for changing the position of the first part of the display element on the display element at set intervals during energy conservation mode, as recited by claims 1 and 13. Claims 11 and 15 include similar features.

Ho discloses a computer system that consists of a processor, a VGA/LCD controller, a number of column and row drivers, and an LCD panel display. The LCD panel display is typically a two-colour grey-scale display. The processor feeds image data to be

displayed on the LCD panel display first the VGA/LCD controller via a bus. The VGA/LCD controller stores the image data in its video memory. In the VGA/LCD controller video memory the image data is stored as a matrix having, for example, 640 columns and 200 rows. Each matrix element i.e. pixel is represented there using a multi-bit vector. The length of the bit vector corresponds to the number of possible grey levels. For example, with 4 bits it is possible to represent 16 grey-levels. The VGA/LCD controller implements the grey-levels by way of frame rate modulation. In the fame rate modulation time is divided into fixed duration intervals. Within an interval there is a number of frame periods, which corresponds to the available grey-levels. The intensity i.e. the grey-level of a given pixel is governed by the number of frame periods that the pixel is turned on. If the pixel is turned on for the entire interval, it has maximum intensity. On the other hand, if the pixel is turned off for the entire interval it is black.

The VGA/LCD controller continuously reads its video memory in order to issue on and off signals to each pixel. There are, for example, 640x200 pixels in the display. The dimensions of the display correspond directly to the dimensions of the aforementioned matrix. The VGA/LCD controller drives the LCD panel display via a number of column and row drivers. Each column driver is in charge of, for example, 80 adjacent single pixel columns. Each row driver in turn is in charge of, for example, 100 adjacent single pixel lines. Thus, in this example there are eight column drivers and two row drivers. From a column driver there are 80 output lines, one for each column. Each column driver comprises a display RAM. The display RAM stores one bit per each pixel. For example, the display RAM of

a single column driver comprises at least 80x100 bits. Each column driver sweeps the LCD panel area in its charge from row-to-row at frequent intervals. At a given row the output lines are turned on or off depending on the pixel bits in the display RAM for that row.

The power saving is implemented in Ho so that certain components of the VGA/LCD controller are turned off in power down mode. The power down mode is entered after the VGA/LCD controller detects that no updates to its video memory have been received in at least two frame periods. The power down mode may also be entered at the request of the user. Upon entering the power down mode, the VGA/LCD controller determines for each matrix element, i.e. pixel, in its video memory whether the corresponding pixel in the LCD panel display should be turned permanently on or off. A pixel is turned permanently on if the corresponding matrix element has a value greater than zero. Otherwise the pixel is turned permanently off. The VGA/LCD controller feeds the altered two-level pixel values to the column and row drivers, which in turn store them to their display RAM memories. Thereupon, the VGA/LCD controller stops executing the frame rate modulation and the column and row drivers are on their own. The column and row drivers keep the LCD panel display pixels on or off depending solely on the last bit values in their RAM memories. The frame rate modulation is no longer applied. Normal operation resumes after the updating of video memory in the VGA/LCD controller is detected.

Regarding independent claims 1, 11, 13 and 15, the Examiner considers them as lacking novelty. The Examiner's thinking appears to be somewhat unclear. As to the first feature of claim 1, the Examiner refers to the column and row drivers in Ho

and the dividing of the LCD panel display are among these drivers. As to the last feature, the Examiner refers merely to the principle of the frame rate modulation, which has clearly nothing to do with the changing of the position of the first part of the display element as set intervals during energy conservation mode.

Firstly, Ho fails to disclose a display element having two modes, a full-screen mode to use the entire display element to display a first information and a partial screen mode to use a first part of the display element in which partial screen mode a second part of the display element is switched off.

In Ho there are no factual full-screen and partial screen modes. In Ho the entire LCD panel display area is used both in the power down mode and in the normal mode. Each column and row driver remains operational in the power down mode as explained hereinbefore. When it comes to the division of pixels into those permanently on or off in the power down mode, the division may not be accurately referred to using the terms "a first part of the display element" and "a second part of the display element". The English word "part" requires some kind of topological connectivity or uniformity to be used pertinently and correctly. For example, a random scattered pattern of pixel is not in that sense a "part of the display element". Besides, if the entire display area happens to have a low intensity grey background in normal mode, the entire display area gets maximum intensity in the power down mode. Therefore, no second part of the display element is switched off. Thus, Ho fails to disclose the feature above.

Secondly, Ho fails to disclose changing means for changing the position of the first part of the display element on the display element at set intervals during energy conservation mode.

In Ho there is no first part of the display element the position of which would be changed at set intervals. In Ho no pixels or larger areas are moved in the power down mode. In fact each pixel remains precisely where it was at the time the power down mode was entered. No shifting, moving or skipping of LCD display panel areas takes place. Further, there are no intervals defined for such position changing procedures. Actually, the moving of pixel data between the areas of different column or row drivers is not even possible in the power down mode since there is no such interaction disclosed in Ho between adjacent drivers. Further, the column or row drivers merely repeatedly produce the bit patterns stored to their display RAM memories. The bit patterns are produced in precisely the same order during the whole power down mode period. No moving of bit values in the display RAM is disclosed. The purpose of the row address shift register 70 is merely to point to the row that is to be outputted via output lines X1, X2,..., Xn at a particular instant.

In the passages cited on this feature, the Examiner refers merely to the principle of frame rate modulation, which has nothing to do with the changing of the position of the first part of the display element at set intervals during energy conservation mode.

At least for these reasons, Applicants respectfully submit that claims 1, 11, 13 and 15 are patentable over Ho. Similarly, dependent claims 2-7, 9-10, 12, and 14 each depend from one of

the independent claims and therefore are also patentable over Ho.

4. Claims 17-23 are new. Claim 17 is directed to a computer usable medium comprising an application for reducing power consumption in an electronic device, including computer program code. When executed by the electronic device the program code causes the electronic device to use a first part of the display element and switch off a second part of the display element to conserve energy, change the position of the first part of the display element on the display element at set intervals during energy conservation mode, and present information on the first part of the display element.

Applicants submit that none of the prior art references render claim 17 unpatentable.

5. Claim 18 is directed to a display module, which comprises a display element for presenting information and has two states, a full screen mode for using the entire display element to present first information and a partial screen mode for using a first part of the display element. In the partial screen mode a second part of the display element is switched off to conserve energy. The display module is also arranged to change the position of the first part of the display element on the display element, to set the state of the display module to energy conservation mode by setting the display element to partial screen mode, and to control the display element to present information during the energy conservation mode on the first part of the display element.

Applicants submit that claim 18 is patentable over the prior art references.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

A check in the amount of $550.00 is enclosed for the additional claims.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,

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